PATENT SPECIFICATION 858,913

DRAWINGS ATTACHED.

Date of filing Complete Specification (under Section 3(3) of the Patents Act, 1949) : Feb. 27, 1959.

Application Date : March 6, 1958. No. 7007/58.
Application Date : Nov. 5, 1958. No. 35598/58.

Complete Specification Published : Jan. 18, 1961.

Index at Acceptance :—Class 81(2), Z3C4.

International Classification :—A61m.

COMPLETE SPECIFICATION.

An Assemblage for Use with a Hypodermic Syringe.

ERRATUM

SPECIFICATION NO. 858,913

Page 1, in the heading *for* "7007/58" *read* "7307/58"

THE PATENT OFFICE,
9th August, 1961

DS 95529/1(3)/R.153 200 7/61 PL

ing injections to animals.

According to the invention there is provided an assemblage for use with a hypodermic syringe, the assemblage comprising a sleeve, a tubular hypodermic-needle carrier slidable axially in the sleeve to project a needle mounted on the carrier through one end of the sleeve, and resiliently interengageable catch means between the sleeve and the carrier necessitating the application of a force to the carrier axially of the sleeve sufficient to overcome the catch means before the carrier can be moved to project the needle from said one end of the sleeve.

In use, the carrier is attached to the syringe, and the sleeve is drawn away from the syringe to enclose the needle and engage the catch means.

The end of the sleeve remote from the syringe is then applied to the skin and pressure is applied to the syringe so that the end of the sleeve is forced against the skin. Accordingly the part of the body which is compressed beneath the sleeve has blood forced out of it and the skin is drawn taut. As soon as the force applied becomes sufficient

the sleeve may have slits extending lengthwise from one end thereby to form said spring fingers on the sleeve.

A specific embodiment of the present invention will now be described, merely by way of example, with reference to the accompanying drawings whereof: —

Figures 1 and 2 are side elevations, partly in cross-section, of an assemblage according to the present invention, and

Figure 3 is a cross-section on line 3—3 in Figure 2.

Referring to the drawings, the assemblage comprises a sleeve 10, and a tubular hypodermic-needle carrier 11 slidable axially in the sleeve to project a hypodermic needle 12 mounted on the carrier 11 through one end, the lower end in Figures 1 and 2, of the sleeve 10. Resiliently interengageable catch means is provided between the sleeve 10 and the carrier 11. The catch means comprises a circumferential shoulder 13 on the carrier, and a plurality of spring fingers 14 on the sleeve.

To form the spring fingers, the sleeve 10 is slit lengthwise from its upper end in the

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COMPLETE SPECIFICATION.

An Assemblage for Use with a Hypodermic Syringe.

I, VIVIAN MORETON, a British Subject, of 27 Queens Gate Mews, London, S.W.7, do hereby declare the invention (a communication from Kuart Meyer, an Austrian Citizen, of Vienna 3, Weyrgasse 6/12.) for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement: —

This invention has for its object to facilitate the administration, and in particular the self administration, of hypodermic injections for example in diabetic cases. It is believed, in addition that the invention may be employed, with advantage, for administering injections to animals.

According to the invention there is provided an assemblage for use with a hypodermic syringe, the assemblage comprising a sleeve, a tubular hypodermic-needle carrier slidable axially in the sleeve to project a needle mounted on the carrier through one end of the sleeve, and resiliently interengageable catch means between the sleeve and the carrier necessitating the application of a force to the carrier axially of the sleeve sufficient to overcome the catch means before the carrier can be moved to project the needle from said one end of the sleeve.

In use, the carrier is attached to the syringe, and the sleeve is drawn away from the syringe to enclose the needle and engage the catch means.

The end of the sleeve remote from the syringe is then applied to the skin and pressure is applied to the syringe so that the end of the sleeve is forced against the skin. Accordingly the part of the body which is compressed beneath the sleeve has blood forced out of it and the skin is drawn taut. As soon as the force applied becomes sufficient to overcome the catch means the carrier is moved rapidly relative to the sleeve, and the needle is plunged into the body, and because the body tissue is compressed by the sleeve, this occurs relatively painlessly.

Preferably, the assemblage comprises stop means for limiting the movement of the carrier in the direction to project the needle through said one end of the sleeve. In this way the depth of penetration of the needle is predetermined.

In one form of the invention the catch means comprises a circumferential shoulder on the carrier, and a plurality of spring fingers on the sleeve.

According to a feature of the invention, the sleeve may have slits extending lengthwise from one end thereby to form said spring fingers on the sleeve.

A specific embodiment of the present invention will now be described, merely by way of example, with reference to the accompanying drawings whereof: —

Figures 1 and 2 are side elevations, partly in cross-section, of an assemblage according to the present invention, and

Figure 3 is a cross-section on line 3—3 in Figure 2.

Referring to the drawings, the assemblage comprises a sleeve 10, and a tubular hypodermic-needle carrier 11 slidable axially in the sleeve to project a hypodermic needle 12 mounted on the carrier 11 through one end, the lower end in Figures 1 and 2, of the sleeve 10. Resiliently interengageable catch means is provided between the sleeve 10 and the carrier 11. The catch means comprises a circumferential shoulder 13 on the carrier, and a plurality of spring fingers 14 on the sleeve.

To form the spring fingers, the sleeve 10 is slit lengthwise from its upper end in the

drawings, the slits extending over about one-half the length of the sleeve.

The shoulder 13 is formed in part by a circumferential groove 16 in the carrier, and the spring fingers 14 have inwardly directed ends 17 capable of engaging in the groove.

The portion 18 of the carrier in front of the groove 16, that is to say on the side of the groove adjacent the needle 12, is a sliding fit in the sleeve 10. The portion 18 is of slightly greater diameter than the portion 19 of the carrier behind the groove, that is to say on the side of the groove remote from the needle, and a circumferential ridge 20 is provided on the carrier immediately behind the groove, the groove and the ridge together forming the shoulder 13. The diameter of the ridge 20 is slightly less than the internal diameter of the sleeve.

The upper end face of the sleeve 10 in Figures 1 and 2 constitutes a stop means for limiting the movement of the carrier in the direction to project the needle 12 through the lower end of the sleeve. Thus, the carrier has a flange 22 at its upper end in Figures 1 and 2 which engages the upper end face of the sleeve when the needle is fully projected, as clearly shown in Figure 2.

The carrier has an axial bore which is enlarged at its upper end to form a frusto-conical socket 25 whereby the assemblage may be attached to a syringe. At its lower end, and within the sleeve 10, the carrier has a frusto-conical stub 23 which serves for mounting a standard hypodermic needle on the carrier. To this end the needle has a cuff 24 formed with a frusto-conical socket into which the stub 23 fits.

In use, the sleeve 10 is drawn away from the syringe to its position as shown in Figure 1. In this position the sleeve fully encloses the needle 12, and the inwardly directed ends 17 of the spring fingers 14 enter the groove 16 and engage with the shoulder 13. The lower end of the sleeve is then applied to the skin and pressure is applied on the syringe tending to force the carrier to move axially through the sleeve. This draws the skin taut as previously explained, and when the force applied becomes sufficient to overcome the catch means the spring fingers 14 are forced outwardly and ride over the ridge 20 whereupon the carrier 11 is moved rapidly through the sleeve to project the needle from the lower end of the sleeve and plunge it into the body. In the present example the shoulder 13 is inclined to the axes of the carrier so that it is able to force the fingers 14 outwardly. Alternatively however the fingers could have end faces which are inclined.

Movement of the carrier relative to the sleeve is limited by the flange 22 when it comes into engagement with the upper end face of the sleeve. The depth of penetration of the needle is therefore predetermined, and in this connection it will be noted that the sleeve is made long enough so that the cuff on the needle does not come into contact with the skin. This is clearly illustrated in Figure 2 which shows the assemblage in its position for an injection with the sleeve in contact with the skin and the needle forced into the body.

For use in making diabetic injections, for example, interchangeable needles 12 may be provided. In each case it will be appreciated that the needles would have a standard mounting cuff, like the cuff 24, enabling them to be attached to the stub 23. Preferably the stub 23 would be of such a size as to take the smallest standard needle cuff, one or more frusto-conical sleeves being provided for positioning on the stub to adapt the stub so that it may take standard needles having cuffs with larger sockets.

It will be appreciated that the carrier may be formed in any convenient manner for the attachment of a hypodermic needle. For example the carrier may have a threaded stub or socket so as to receive a correspondingly threaded part attached to the needle. Thus the needle may have an internally threaded cuff and the carrier a stub or spigot which is correspondingly threaded for insertion into the cuff. In that case the cuff would be provided with flats enabling it to be screwed on and off the stub.

Instead of providing for a removable needle, the needle may be permanently attached to the carrier.

It is preferred however that the carrier be formed with a standard hypodermic needle mounting, and where the assemblage is intended for veterinary use the carrier would preferably be formed with the or a standard hypodermic needle mounting for such needles as are used for that purpose. Where the assemblage is adapted for use with detachable needles, it is preferred, as in the case of the specific example described above with reference to the drawings, that the needle cuff lie at all times within the sleeve. This means that the sleeve must be removed from the carrier in order to attach or change the needle. This may be done by withdrawing the carrier member through the upper end of the sleeve, the spring fingers being forced to ride over the larger diameter portion 18 of the carrier.

If it is required to be able to adjust the depth of penetration of the needle, adjustable stop means may be provided, adjustable to alter the range of movement of the carrier 11 to project the needle through the lower end of the sleeve 10 in Figures 1 and 2. To this end the flange 22 may be made adjustable along the portion 19 of the carrier. This may be achieved in any convenient manner, the only requirement being that the flange shall be locked against movement relative to

the carrier in each of its selected positions.

Alternatively or in addition, the sleeve 10 may be adjustable in length thereby to alter the extent of the projection of the needle through the lower end of the sleeve.

This may be achieved for example by forming the sleeve in two telescoped parts which are normally locked together. The outer part should be about one-half the length of the inner part which would correspond with the sleeve 10 in the drawings, and would be slidable on the lower end part of the inner sleeve, means being provided to lock the two sleeve parts together in a number of predetermined positions.

The assemblage described with reference to the drawings is of metal and is chromium plated.

WHAT I CLAIM IS: —

1. An assemblage for use with a hypodermic syringe, the assemblage comprising a sleeve, a tubular hypodermic-needle carrier slidable axially in the sleeve to project a needle mounted on the carrier through one end of the sleeve, and resiliently interengageable catch means between the sleeve and the carrier necessitating the application of a force to the carrier axially of the sleeve sufficient to overcome the catch means before the carrier can be moved to project the needle from said one end of the sleeve.

2. An assemblage as claimed in Claim 1, comprising stop means for limiting the movement of the carrier in the direction to project the needle through said one end of the sleeve.

3. An assemblage as claimed in Claim 2, wherein said stop means is constituted by the end face of said sleeve remote from said one end of said sleeve, and said carrier has a flange which engages said end face when the needle is fully projected.

4. An assemblage as claimed in Claim 2, or Claim 3, wherein said stop means is adjustable to alter the range of movement of the carrier to project the needle through said one end of the sleeve.

5. An assemblage as claimed in any one of the preceding claims, wherein said sleeve is adjustable in length thereby to alter the extent of the projection of the needle through said one end of the sleeve.

6. An assemblage as claimed in any one of the preceding claims, wherein said catch means comprises a shoulder and a spring finger, one on the sleeve, and the other on the carrier.

7. An assemblage as claimed in any one of Claims 1 to 5, wherein said catch means comprises a circumferential shoulder on said carrier, and a plurality of spring fingers on said sleeve.

8. An assemblage as claimed in Claim 7, wherein said sleeve has slits extending lengthwise from one end, thereby to form said spring fingers on the sleeve.

9. An assemblage as claimed in Claim 7 or Claim 8, wherein said shoulder is formed at least in part by a circumferential groove in said carrier, and the spring fingers have inwardly directed ends capable of engaging in the groove.

10. An assemblage as claimed in Claim 9, wherein the portion of the carrier in front of the groove is a sliding fit in the sleeve, said front portion being of slightly greater diameter than the portion of the carrier behind the groove and a circumferential ridge is provided on the carrier immediately behind the groove, the groove and the ridge together forming said shoulder.

11. An assemblage as claimed in any one of the preceding claims, comprising a hypodermic needle permanently attached to said carrier.

12. An assemblage as claimed in any one of the preceding Claims 1 to 10, comprising a hypodermic needle removably attached to said carrier.

13. An assemblage as claimed in any one of the preceding Claims 1 to 10, wherein the carrier is formed with the or a standard hypodermic needle mounting for a needle for making diabetic injections.

14. An assemblage as claimed in any one of the preceding Claims 1 to 10, wherein the carrier is formed with the or a standard hypodermic needle mounting for veterinary needles.

15. An assemblage as claimed in any of Claims 1 to 10, wherein the carrier is formed with a standard hypodermic needle mounting.

16. An assemblage for use with a hypodermic syringe, comprising a tubular needle carrier, a sleeve on said carrier member to surround the needle, the carrier being slidable in said sleeve to project a hypodermic needle carrier by the carrier out of one end of the sleeve, and spring catch means to resist such sliding movement.

17. An assemblage as claimed in Claim 1, for use with a hypodermic syringe, constructed and arranged substantially as hereinbefore described with reference to the accompanying drawings.

18. An assemblage for use with a hypodermic syringe, constructed and arranged substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

For the Applicant,
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PROVISIONAL SPECIFICATION.
No. 7307, A.D. 1958.

Hypodermic Syringes and Needles Therefor.

I, VIVIAN MORETON, a British Subject, of 27 Queens Gate Mews, London, S.W.7, do hereby declare this invention (a communication from Kuart Meyer, an Austrian Citizen, of Vienna 3, Weyrgasse 6/12.) to be described in the following statement:—

The invention has for its object to reduce or eliminate the pain of introducing a hypodermic needle.

According to this invention a tubular member is attachable to the syringe and there is a sleeve to surround the needle, the sleeve being slidable along said member towards the syringe whereupon the needle is moved out of one end of the sleeve, spring means being provided to resist such movement.

In use the sleeve is drawn away from the syringe completely to surround the needle and the spring means holds it in this position. The end of the sleeve remote from the syringe is applied to the skin and pressure is applied to the syringe so that the end of the sleeve is forced against the skin. Accordingly the part of the body which is compressed beneath the sleeve has blood forced out of it and the skin is drawn taut. When a certain pressure is applied to the syringe the spring means is suddenly overcome and the needle is rapidly plunged into the body, which because it is compressed by the sleeve, occurs relatively painlessly. The tubular member is flanged to limit movement of the sleeve and thence the depth to which the needle enters the body.

In one arrangement the needle projects from one end of the tubular member, the other end of which is flanged and which is attachable to the syringe. A circumferential ridge is formed mid-way along the length of the tubular member. From the ridge to the needle the tubular member is slightly greater in diameter than from the ridge to the flange on said member. A circumferential groove is formed between the ridge and the portion of greater diameter.

The sleeve is slit lengthwise from one end to form a plurality of spring fingers the free extremities of which are inwardly directed. The fingers grip the portion of larger diameter and resist free movement of the sleeve along the tubular member. The fingers, however, do not grip the portion of smaller diameter. The inward extremities of the fingers enter the groove, the needle in this position being completely covered by the part of the sleeve which extends beyond the tubular member. In this position when sufficient force has been applied endwise to the sleeve by the syringe the spring fingers will open and ride over the ridge. When the fingers have passed over the ridge further movement of the sleeve along the tubular member is unimpeded until the finger extremities come against the flange.

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PROVISIONAL SPECIFICATION.
No. 35598, A.D. 1958.

Hypodermic Syringes and Needles Therefor.

I, VIVIAN MORETON, a British Subject, of 27 Queens Gate Mews, London, S.W.7, do hereby declare this invention to be described in the following statement:—

In the Specification of Patent Application No. 7307/58 there is described a hypodermic needle assembly constructed so as to reduce or eliminate the pain of puncturing the skin by the needle. According to that Application the assembly comprises a tubular member which carries the hollow needle and which is attached to the syringe, a sleeve to surround the tubular member and slidable therealong and spring means provided to resist such movement of the sleeve, the arrangement being that in one position the sleeve covers the hollow needle and upon a sufficient pressure being applied to the syringe to overcome the spring force resisting movement of the sleeve the latter slides along the tubular member so that the hollow needle suddenly penetrates the skin.

The object of this invention is to enable the needle itself to be interchangeably fitted to the needle assembly.

According to this invention the hollow needle is carried by a coupling member which is removably attached to the tubular

member. In one arrangement the hollow needle is attached (e.g. soldered or brazed) to a cuff which is threaded to be received by a correspondingly threaded part of the tubular member. The cuff is preferably threaded internally and the tubular member has a spigot which is correspondingly threaded for insertion into the cuff.

The cuff may be provided with a pair of flats to receive a spanner so that the cuff may be easily removed from the tubular member and adequately secured thereto.

In another arrangement the cuff and the tubular member have mating tapered surfaces so that the needle with its cuff may be removably secured to the tubular member. The cuff may have a tapered part which is inserted into the tubular member, the latter being correspondingly formed or the tubular member may be inserted into the cuff.

It is preferred that the joint between the threaded cuff and the corresponding part of the tubular member lies at all times within the slidable sleeve so that the sleeve must be removed from the tubular member to gain access to the cuff for removal and replacement of the hollow needle.

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1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale

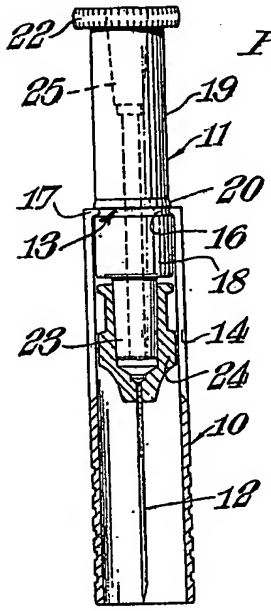

Fig. 1.

Fig. 2.

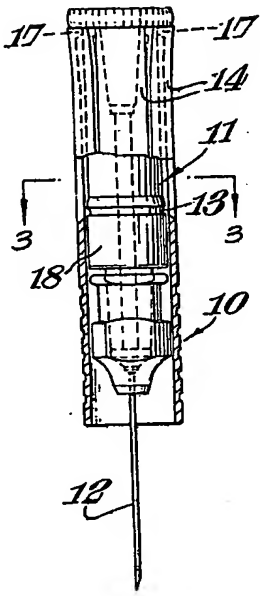

Fig. 3.